

# Environmental Energy Technologies Division

## Integrated Safety Management Plan

Original: June 5, 1998

Rev. 1: 10/20/1999	Rev. 5: 6/9/2004	Rev. 9: 12/18/2008	
Rev. 2: 6/23/2001	Rev. 6: 6/3/2005		
Rev. 3: 7/10/2002	Rev. 7: 6/19/2006		
Rev. 4: 6/29/2003	Rev. 8: 10/1/2007		

### 1. Purpose

The Environmental Energy Technologies Division (EETD) Integrated Safety Management Plan has been written to implement the Integrated Safety Management System (ISMS) for the Division. Berkeley Lab uses the ISMS as a means for assuring that work is performed safely. It is built around five core ISM work functions and seven guiding ISM principles.<sup>1</sup> The Berkeley Lab Integrated Environment, Health & Safety Management Plan, PUB-3140, documents how the Berkeley Lab implements the ISMS throughout all its work functions. Discussion of the Berkeley Lab ISMS Plan, including the principles and work functions, can also be found in Chapter 1 of the Health & Safety Manual, PUB-3000. The Laboratory's ES&H policies and requirements are established in the Health & Safety Manual, PUB-3000; the Worker Safety & Health Program, PUB-3851; the Regulations and Procedures Manual (RPM), PUB-201; and the Operating and Assurance Program Plan (OAP), PUB-3111. These publications establish line management responsibilities and define authorities and authorizations. This Division Safety Plan establishes the mechanisms and fundamental management strategy that will ensure that all institutional ES&H policies and procedures are properly implemented.

### 2. Division Safety Structure

The EETD Environment, Safety & Health (ES&H) program structure consists of the Division Director, the Assistant Division Director for ES&H and Space (representing Division senior management and chair of the Safety Committee), the Division Safety Coordinator, and the Safety Committee. The Division consists of five research Departments. These five Departments are further divided into 28 research facilities. Each research facility has a particular research focus, and a relatively unique set of tasks, hazards and controls. With some exceptions, each research facility has its own Job Hazard Analysis (JHA) Work Group associated with it. Each research facility conducts research in one or more buildings and rooms, has one or more Principal Investigators (PIs), and one or more Work Leads. Each room (Technical Area) has an Area Safety Leader assigned to coordinate safety issues. The Area Safety Leader is typically the same person as the facility Work Lead. PIs, Work Leads, Area Safety Leaders, and Technical Areas are further defined in PUB-3000, Sect. 1.9, <http://www.lbl.gov/ehs/pub3000/CH01.html#sec19>.

### 3. ES&H Roles, Responsibilities and Accountability

All Division staff, including the Division Director, Department Heads, Group Leaders, Principal Investigators (PIs), Work Leaders, Area Safety Leaders, and Supervisors are responsible for ES&H compliance, as per PUB-3000, Chap. 1, <http://www.lbl.gov/ehs/pub3000/CH01.html>.

Principal Investigators (PIs) are responsible and accountable to their supervisors and associated line management up to and including the Division Director, for assuring that all activities are carried out in a safe manner and in accordance with all Laboratory ES&H requirements. This responsibility and accountability cannot be delegated, but it is recognized that other staff, guests, or students working under the PI may also have ES&H managerial responsibilities. PIs ensure that the JHA documents relevant to the work, activities, and operations are completed. They assure that appropriate authorizations are implemented and workers are properly trained in safety and emergency procedures. They consult with qualified specialists (e.g., the Division Safety Coordinator or subject matter experts from the EH&S Division) to resolve any questions about ES&H requirements. ES&H performance of the Principal Investigators is reviewed by use of the annual performance review.

As part of line management, PIs are expected to remain fully cognizant and responsive to conditions and practices within the laboratories or other spaces for which they have responsibility. To meet this expectation, PIs must constantly monitor research activities and working conditions in these areas and perform periodic inspections or walkthroughs of these areas, which are required at least quarterly. Senior line management must also participate in periodic inspections or walkthroughs of their areas, including both laboratory and office spaces. Walkthrough checklists for line managers are available in the form of pocket guides, an LBNL standard Walkaround Checklist, or a [Lab Safety Inspection Checklist tailored to EETD](#). Walkthroughs must be documented by use of notes of inspection results, date(s), and locations(s); completed inspection forms; and/or Corrective Action Tracking System (CATS) records.

All employees, participating guests, and visitors are responsible for working safely; knowing and following the ISM core functions, guiding principles and other ES&H requirements that apply to their work; and cooperating with Lab and Division ES&H efforts. Whenever an employee, participating guest or visitor encounters conditions or practices that appear to constitute an imminent danger (i.e., high potential for death or serious injury) or environmental harm, they have the authority and responsibility to

- alert the affected employee(s) and request the work be stopped;
- call x7911 if it is a life-threatening emergency, or call x6999 to report the incident – EH&S staff will investigate it; and
- inform (to the extent possible) the person with immediate line management authority, the Division Safety Coordinator, or the Assistant Division Director for ES&H and Space and the Division Director.

Supervisors will meet at least annually with their employees to review and discuss safety issues, identify and evaluate job hazards that may pose risk of accident and/or injury, and develop appropriate hazard controls. This meeting is typically a part of the annual performance review process, but these discussions should occur any time the need arises.

The Division Council is composed of the Division Director, Deputy Division Director, Assistant Division Director for ES&H, Business Manager, leader of the Program Development Office, and heads and deputies of each of the research departments. Division Council meets every week (schedules permitting), and provides management assistance and guidance to the Division Director on a broad range of issues, including ES&H. Safety is a standing agenda item at each Division Council meeting. The Council deliberates ES&H subjects reported by the Assistant Director for ES&H and reports prepared by the Safety Coordinator. The Council serves as a forum for the discussion of and possible action on any ES&H issue for which Division management advice and/or action is appropriate.

#### 4. Division ES&H (Safety) Committee

The Division maintains a Safety Committee, consisting of the Assistant Division Director for ES&H and Space, who chairs the committee and represents the Division Director, the Division Safety Coordinator, the EH&S Division Liaison, the Deputy Division Director, the Division Business Manager. The Division Safety Committee has two sub-committees that represent lab and office environments in the division. (The Assistant Division Director for ES&H and Space represents the Division on LBNL's Safety Review Committee (SRC)). The Safety Committee meets quarterly, or more often if issues warrant, and reports to the Division Director regarding any current or systemic safety issues within the Division. The principal functions of the Safety Committee are to assist the Division Safety Coordinator and Assistant Division Director in identifying and addressing ES&H issues within the division. This assistance may include walkthroughs and inspections of Division lab facilities, reviews of reports prepared by the Safety Coordinator for Division Management and other assistance as needed to support the Division in carrying out its safety responsibilities.

The Safety Committee may assist in the preparation of an annual self-assessment report for the Division Director and the Office of Contract Assurance that includes an evaluation of how well this Division Safety Plan is implemented. The Safety Committee also assures that the Division works to improve the effectiveness of the Division safety program through the dissemination of lessons learned and other appropriate feedback mechanisms. The EETD Safety Committee Charter contains further details.

Other Division Safety Committee activities may include assisting in the annual reviews of AHDs; evaluation and promotion of good ergonomic practices; safety reviews of new and continuing work proposals; and participating in occurrence report processing to the extent necessary.

The Division's representative on LBNL's Safety Review Committee (SRC) and a representative from the Environment, Health & Safety (EH&S) Division (the EH&S Division Liaison) sit on the Safety Committee to provide updated information and training to the committee network. These representatives also take input and concerns expressed by the committee membership about the Division needs and impact of procedures on the Division back to their respective organizations. The committee makes use of other expertise within the EH&S Division for specific ES&H issues that arise. The EH&S Division and the Office of Contract Assurance (OCA) are prime resources for the Division in the implementation of DOE, state and other federal regulations.

## 5. Divisional Safety Oversight

The Division Safety Coordinator, with the assistance of the Safety Committee, as necessary, conducts safety reviews and inspections, and provides safety review documents for use by the EETD line management. Division Safety Coordinator duties include:

- Safety reports as needed to Division management that includes some or all of the following topics: CATS statistics, SAA compliance statistics, JHA conformity and training summary, status of AHDs, Self-Assessment status, injury reports, reportable occurrences, and special problems.
- A discussion at an appropriate Division Council meeting of the findings and results of the annual self-inspection process and reporting to OCA.
- Quarterly formal inspections of all SAAs. In addition, other informal inspections and walkthrough evaluations will be conducted as warranted, with a focus on those SAAs or other entities that failed to maintain compliance with laboratory or division safety practices. At least one inspection annually will be done in the company of the responsible line management personnel (typically the PI).
- Periodic walkthroughs of all lab space and a representative sample of office space, typically quarterly, to monitor the ongoing conditions and practices in the labs, and to follow-up on the annual Self-Assessment inspections by the PIs.
- Annual AHD reviews done in conjunction with the PI and/or other staff responsible for the facility.
- Project Safety Review approvals.
- Review of corrective action plans developed by the PI and/or responsible staff for any research facility or operation for which safety issues persist.

The Division, through its Safety Committee, conducts an annual self-assessment that involves safety reviews and inspections of all Division laboratory space by the PIs and research groups. Topics reviewed during these inspections cover all aspects of Environment, Health & Safety compliance. Findings are entered into the LBNL Corrective Action Tracking System (CATS), maintained by the Office of Contract Assurance, to facilitate tracking, trending and budget planning. The Division's Safety Committee does follow-up inspections for verification, oversees (to the extent necessary) development of any corrective action plans and preventive measures, assists the PIs,

Work Leads, and Building Managers in resolving open findings, and alerts the Division Director to specific problems or non-compliant areas, as warranted.

Besides the annual Self-Assessment process, the Division uses a Project Safety Review form to evaluate new and on-going projects for new or changed hazards, for the need for new or modified safety authorizations, to identify new or modified staff and training requirements, and to assure that the proper administrative or engineering controls are implemented. This form reminds PIs that they must allocate appropriate resources for these ES&H concerns. All proposals for new projects and annual reviews of continuing projects must include the Project Safety Review form. This form is reviewed and approved by the Division Safety Coordinator.

Historically, ergonomic injuries comprise about 54% of all EETD injuries. Ergonomics is not just about the proper work equipment - it is critical that all staff also understand the importance of early reporting of discomfort and the use of workload management as strategies for preventing ergonomic injuries. The online Remedy Interactive ergonomic self-assessment, EHS0059, is required for personnel who work at a computer for more than an average of 4 hours per day and is recommended for all other computer users. EHS0062, Worksmart Ergonomics, focuses on lifting and other material handling issues. Additional ergonomics training can be conducted by EH&S staff for laboratory and other specialized tasks. An ergonomic workstation evaluation is required whenever there is pain or discomfort, or whenever computer usage is more than an average of 4 hours per day. A current ergonomic workstation evaluation is strongly recommended for all other computer users, especially when there are significant changes to the workstation set-up, when the workstation is relocated, or for new hires. EH&S Division evaluators are used for more critical evaluations where there are injuries, discomfort, or other complexities involved. EETD has an in-house team of trained evaluators who conduct routine evaluations, assist with evaluation follow-up tasks, promote ergonomic issues awareness and early reporting, and identify risk factors such as problem postures and work habits.

An injury investigation meeting will be held to discuss each injury in the Division. The injured person, their supervisor, the Division Safety Coordinator, and the EH&S Division Liaison participate in these meetings. Additionally, the EETD Assistant Division Director for ES&H participates in the investigation of DOE Recordable accidents and injuries, and presents the findings to the Division Safety Committee.

Typically the EETD Assistant Division Director discusses these and other safety related topics with the Division Director and/or the Division Council. Applicable information from the Laboratory's lessons learned program and any relevant EETD incidents will be disseminated to Division personnel for accident prevention and hazard awareness.

A broad range of communication avenues is utilized in the Division to maintain accountability and convey ES&H subjects both up and down the chain of command. One key communication avenue is the link directly to the Division Director and Senior Division Management by way of the Assistant Division Director for ES&H. Other communication avenues include ES&H articles in the weekly What's New in EETD

newsletter, Division-wide or focused email communications, periodic Division-wide Town Hall meetings, Safety Committee meetings, group meetings, safety personnel and Line Management walkthroughs, and as-needed reports (typically quarterly) from the Division Safety Coordinator to Division Senior Management. Safety should be an agenda item in all regular department, program, and group meetings.

## 6. Scope of Work Authorized

### a. General

Division research incorporates many diverse disciplines - physics, engineering, chemistry, architecture, economics, computer science, life science, and others. The Division maintains uniquely advanced research and test facilities available for cooperative and sponsored R&D in energy efficiency and environmental health. Details on the scope of work authorized for individuals are documented in the online Job Hazards Analysis (JHA). The JHA lists hazards and controls (including training) for each authorized task.

Scope of work for each research facility technical area is also summarized in the online Hazard Management System (HMS) database. The HMS database contains an inventory of hazards and equipment for each technical area room and responsible person. The HMS EH&S summary report can be used to pull together information from 10 EH&S source systems (e.g., the chemical inventory (CMS), Activity Hazard Documents (AHDs), building mechanical systems, etc.) into a single report

The JHA and HMS are updated whenever there are significant changes, and at least annually. The JHA and HMS are an important part of this authorization process and describe the range of permitted work. The Principal Investigator must bring any work outside of the authorized scope of work to the attention of the Division Safety Coordinator prior to commencement or contractual commitment, when help is needed to determine ES&H impact or proper documentation.

### b. Off-site work

All Division employees working off-site are expected to practice at least the same level of safety awareness required at LBNL, and are required to be knowledgeable of any additional safety requirements at the off-site facility appropriate to the task they are performing. Division personnel working off-site are required to maintain in their JHA an accurate list of tasks and hazards associated with the offsite work, and comply with the controls specified within their JHA, unless they are working at an institution that has its own safety program. Under no circumstances will EET Division employees conduct themselves in such a fashion that will place themselves, the host facility personnel, or any member of the public in danger or increase risk or liability. Examples of off-site work include short or long-term assignments in UCB Campus space, at LBNL's Washington, D.C. office, at field sites, etc. Offsite experimental work that is not in UCB campus

space must have an EETD Offsite Safety Review form filled out and reviewed by the Division Safety Coordinator before the offsite work commences.

Specifically, LBNL work performed at the UC Berkeley campus must conform to the “Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures” dated March 15, 2004, as provided in the LBNL Institutional ISM Plan: [http://www.lbl.gov/ehs/ism/ucb\\_lbl\\_partnership\\_3\\_15\\_04.pdf](http://www.lbl.gov/ehs/ism/ucb_lbl_partnership_3_15_04.pdf).

- Lab PIs have an obligation to Berkeley Lab management to provide a safe workplace for all Berkeley Lab-sponsored work. At UCB, this is satisfied by complying with the UCB Safety System.
- Lab PIs are responsible for analyzing work of persons under their direction and for assuring that the proper training for safe conduct of work is identified and obtained. Until an individual has been properly trained, s/he will work under the direct supervision of someone who is already trained. The type and method of training for work performed at UCB is specified by UC Berkeley.
- Lab PIs conducting Berkeley Lab-sponsored work are free to implement controls and other measures beyond the institutional requirements if they deem it appropriate.
- Lab PIs working at UCB can request a joint safety assessment (to be conducted by representatives of both the UCB and LBNL EH&S organizations) to further aid them in ensuring a safe workplace.
- Lab PIs conducting Berkeley Lab-sponsored work at UCB will comply with UCB standards including properly specifying training requirements (for themselves, workers and students), obtaining and adhering to UCB work authorizations, and meeting UCB self-inspection requirements.

#### c. Work Requiring Specific Approval

As part of each project proposal, the Principal Investigator completes an EETD Project Safety Review form and fills out the NEPA/CEQA Review document. For each funded project, the Principal Investigator prepares ES&H documentation and obtains required approvals for potentially hazardous or regulated work as specified in Chapter 6 of PUB-3000 prior to commencement of the work. The PI is expected to maintain accurate safety documentation (including a chemical inventory); and reevaluate his hazard assessment when necessary, and at least annually during the Division’s Self-Assessment process. The following table lists authorizations active, as of December 2008, in the Division. Details as to the Facility, location, and Principal Investigator can be found in the 2008 EETD Self-Assessment Report section shown.

Authorization	Number	2008 SA Report [Appendix 1]
Activity Hazard Document (AHD)	11	Table 2

Radiation Work Authorization (RWA)	1	Table 8
Sealed Source Authorization (SSA)	1	Table 8
Generally Licensed Authorization (GLA)	7	Table 8
X-Ray Authorization	1	Table 8
Satellite Accumulation Area (SAA)	26	Table 9
Rad. Waste Collection Area (RWCA)	1	Table 9

d. Work carried out by outside contractors

EETD participates in the Non-Construction Safety Assurance for Subcontractors, Vendors and Guests Working at LBNL Facilities program (as defined in PUB-3000 Chapter 31). This program assures that these workers are conducting their work safely under a work authorization that has utilized the five core Integrated Safety Management (ISM) principles.

## 7. Qualifications and Training

The Principal Investigator and/or supervisor will determine the requisite qualifications to function safely, and will document that the employee possesses these qualifications. This applies to students and guests as well. The tool used for this determination and documentation is primarily the JHA and any applicable formal authorizations. Also relevant are the employee's Training Profile, Job Description, performance evaluation, and any relevant Facility Notebook or similar documents covering the experimental facility in which the employee, student or guest works. Until such safety qualifications have been established and satisfied, individuals will only be allowed to work under the supervision of a qualified employee. An exception to this work under supervision rule is that any training related to a formal authorization must be completed before any related work can be done under the authorization. Qualifications include skills, knowledge, training and certifications required by law or by Laboratory policy.

The JHA Training Profile shows what training courses are required and recommended, and whether the requirements have been met. The employee, visitor, or participating guest updates their JHA annually, or upon any significant change in work tasks, hazards or controls. The supervisor continuously ensures that their employee's required training is satisfied. New employees are required to complete the JHA before beginning work, and complete required training within 90 days. Further details on the EET Division Training Policy are outlined on the Division intranet site.

Qualifications and training are reviewed by the Safety Committee as part of the annual Self-Assessment report prepared by the Division.

## 8. Balanced Resources



Principal Investigators incorporate appropriate resources for ES&H concerns in all research proposals, to include provisions for safety equipment, permits, training, maintenance, waste disposal, and facilities modifications.

## 9. ES&H Resources

To facilitate implementation and execution of this EET Division Safety Program, the following resources are made available:

0.30 FTE	Assistant Division Director for ES&H and Space
0.88 FTE	Division Safety Coordinator

The following resources are made available by the EH&S Division on a matrix basis. They are available to assist Principal Investigators, the Safety Committee, and the Division staff in general with any aspects relating to the implementation of this program. The matrixed individuals are accountable to the EETD Safety Committee Chair.

0.20 FTE	Division Liaison
0.10 FTE	Laser Safety
0.10 FTE	Industrial Hygiene (AHD & process reviews, hazard & exposure evaluations, ventilation surveys, participation in surveys, etc.)
0.04 FTE	Radiation Protection
0.01 FTE	Occupational Safety (elevated work, machine safeguarding, material handling, tools, transportation, etc.)
0.01 FTE	Electrical Safety
0.46 FTE	Total

---

### <sup>1</sup>Core ISM functions:

1. Define the scope of work.
2. Identify and evaluate the hazards of the work.
3. Develop and implement controls for the hazards.
4. Perform the work as authorized.
5. Sustain continuous improvement from regular feedback.

In carrying out these functions, divisions are guided by the seven ISM principles:

- I. Line Management Accountability
  - II. Clear Roles & Responsibilities
  - III. Competence Commensurate with Responsibilities
  - IV. Balanced Priorities
  - V. Identification of Safety Standards
  - VI. Hazard Controls Tailored to Work being Performed
  - VII. Requirements and Operations Authorizations
-



Annual Update Approved By:

\_\_\_\_\_  
Arun Majumdar  
EET Division Director

Date: \_\_\_\_\_

\_\_\_\_\_  
Robert Kostecki  
Assistant Division Director for ES&H and Space

Date: \_\_\_\_\_

\_\_\_\_\_  
Guy Kelley  
Division Safety Coordinator

Date: \_\_\_\_\_